The Economic Impact of the Seafood Sector:

An Daingean

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Foreword

The Economic Impact of the Seafood Sector: An Daingean

In 2019, BIM completed the project to evaluate Ireland's top ten seafood ports and assess the importance of the seafood sector directly and downstream in these ports, their hinterlands and at the regional and national levels. The seafood sector is a primary driver of rural economies around the coastline of Ireland and acts as an anchor in these locations around which other supporting service sectors develop. This report reveals the results of this project for the port of An Daingean (Dingle) and its hinterland. An Daingean is an important seafood port in Ireland with high volumes of seafood landed here annually.

An Daingean is located in the Dingle peninsula in county Kerry. The Dingle peninsula is recognised globally as an area of outstanding natural beauty that attracts large quantities of tourists to the region. The landscape is mainly mountainous with areas of rolling lowlands, and the typical soils present lead the agriculture land to be described as medium to poor. An Daingean is located at significant distances to major urban areas with the closest being Limerick (147km), followed by Cork (156km) and Dublin (345km). Dingle is connected by a national road to Limerick with road connections to the capital estimated at over 4 hours. These factors dictate that the seafood industry is an important driver of the local economy after the tourism, manufacturing and agriculture sectors.

In this report, it is shown that the seafood sector has significant multiplier effects in terms of gross value added, employment and wages downstream in the local economy. In total, 8% of the Dingle Peninsula economy can be attributed to the seafood sector encompassing direct, indirect and induced effects. Direct employment of the seafood economy in the region is 330 while a further 105 jobs are generated locally through the supply chain and induced effects. The sector generates €6.3 million annually in direct wages and stimulates a further €3.9 million downstream at the regional level. Further downstream effects occur outside the region at the national level.

Participation in this survey by seafood producers around An Daingean was the joint-highest of this project, with a response rate of 57%. Special thanks are due to all participants in the survey and to Tom Kennedy and Lorcán O'Connéide for their assistance in this project. Richard Curtin, Economic and Strategic Services Unit, BIM, would also like to recognise the excellent work carried out by Oxford Economics and Perceptive Insight in the course of this project.

Executive summary

The seafood sector at the port

The seafood sector makes an important contribution to the An Daingean economy. In 2018, direct seafood related activity at the port generated €39.2 million in turnover, supporting 330 direct jobs or 8% of employment across the local port economy. Fish processing is the largest seafood sub-sector at the port, generating €24.8 million in turnover, followed by commercial fishing (€8.1 million) and aquaculture (€6.3 million). When translated into GVA, the overall seafood sector makes a €18.9 million direct contribution to the local port economy.[1]

Our survey explores the characteristics of businesses operating in this sector. In general, they are typically well-established, having operated for more than 10 years, and turnover tends to be relatively stable year-on-year. Seafood businesses at An Daingean port typically invest more in capital relative to the other main ports included within the study, particularly in the commercial fishing sub-sector. The workforce tends to originate from the local area, and although two-fifths of sales are exports, the end-market for seafood produce tends to be more domestically-focussed than at other ports in Ireland.

Analysing the survey results allows us to quantify the port's seafood sector value within the regional economy. Once the indirect and induced effects are calculated, we estimate that the total economic contribution of the seafood sector at An Daingean equated to €27.7 million of GVA across the south-west economy in 2018. The seafood sector at this port also supported an estimated 430 jobs across the region, and generated €4 million in tax revenues.

€18.9m
Direct GVA in 2018
The seafood sector makes a significant contribution within the local port economy.

€27.7m
Total GVA contribution to the South-West in 2018
The seafood sector makes a significant contribution to the wider regional economy.

Fig. 1. The estimated benefits of the port seafood sector, South-West, 2018

Ports seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	18.9	330	6.3
Indirect	5.8	65	2.4
Induced	3.1	40	1.5
Total	**27.7**	**430**	**10.1**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

1 We define the local port economy as the port's District Electoral Division (DEDs)and those surrounding it – see **Fig. 2**.

The role of the individual seafood sub-sectors

Our analysis of the seafood sector at the port provides the following headline findings throughout the region (which include the combined direct, indirect and induced impacts):[2]

- Activity in the commercial fishing sub-sector has been estimated to sustain 135 jobs, €3 million of wages and €7.5 million of GVA;
- Activity in the aquaculture sub-sector has been estimated to sustain 135 jobs, €2.1 million of wages and €5.7 million of GVA; and
- Activity in the fish processing sub-sector has been estimated to sustain 170 jobs, €5.4 million of wages and €15.6 million of GVA.

Socio-economic characteristics

Although the port area's unemployment rate is relatively low, this masks above average rates of economic inactivity relative to the national average. The data also suggests that local employment opportunities may be limited with prominent flows of net out-commuting alongside relatively weak population growth – especially among those of working age.

Agriculture, forestry & fishing forms a relatively large proportion of economic activity within the local port economy, driven to an extent by activities in the seafood sector at the port. The local port economy is also characterised by sectors linked to tourism activity – such as trade, hospitality & transport and arts, entertainment & other services. However, given a relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term.

As a result, the seafood sector is likely to continue to play an important role in the local port economy through its provision of accessible direct jobs, supply chain spending in local businesses and the consumers spending it supports. Looking forward, a vibrant and growing local seafood sector is likely to remain a prominent asset for the local economy.

2 Summing the benefits of all three elements within our definition of the seafood sector (commercial fishing, aquaculture and fish processing) will overestimate the indirect and induced impacts, and as a result, overall impacts. This is because the supply chain of the processing sub-sector will likely contain a proportion of the port's fishing sub-sector and its supply chain. To get the direct totals (for employment, GVA and wages), we add all the three sub-sectors. However, for the indirect and induced totals, we sum those of the fish processing sub-sector with a proportionate share of the commercial fishing and aquaculture (according to the proportion of sales not destined for local processors and informed by the interview process). The remainder of the fishing and aquaculture indirect and induced impacts will already be accounted for within that of the fish processors.

1. Introduction

1.1 About the study

The Irish seafood sector is an important component of the Irish economy. It is, however, more important to coastal communities around the country given its concentration at Ireland's ports and the relatively lower level of alternative economic activity in these economies. In addition, as economic and employment growth is increasingly driven by office-based activity which favours urban areas, the seafood sector's role in providing labour market opportunities, wages and local demand in these local areas is arguably rising.

Against this backdrop, Bord Iascaigh Mhara (BIM) commissioned Oxford Economics and Perceptive Insight to estimate the economic contribution of the seafood sector in ten of Ireland's ports.

1.2 The seafood sector at the port

This report concentrates on the seafood sector of just one of these ports – An Daingean, located on the coast of county Kerry in the south-west region. In this report, we define the local port economy as the District Electoral Divisions (DED) of Dingle and those surrounding it, which constitute its hinterland – informed by BIM and shown in the below figure.

Fig. 2. Map of the port area within the study

To inform the analysis, a comprehensive seafood-related survey exercise was carried out across Ireland's main ports. We worked closely with BIM in order to, firstly, understand the seafood population at each of the 10 ports. Following this, the market research firm Perceptive Insight collected information concerning the characteristics of the local seafood sector through both telephone and electronic surveys.

In total, there were close to 470 individual responses from seafood-related businesses across Ireland. Of this total, close to 330 unique responses were recorded from seafood operators based in the 10 port areas – a response rate of close to 40%, relative to the known seafood population. The study also draws on published data where available to better understand the sectoral composition of coastal areas within the country. **Appendix 1** of this report includes a summary discussion of the pertinent issues facing the local port economy.

1.3 The key elements of the seafood sector

In this paper we present our estimates of the size of the local seafood sector and how it impacts the regional economy. Our analysis therefore estimates the direct activity associated with the commercial fishing, aquaculture and fish processing sub-sectors at the port by drawing on the survey findings and information held by BIM. We then estimate their wider impacts within the local NUTS3 region. These wider impacts include those associated with the seafood sector's supply chain and the consumer spending of those employed as a result of the direct and indirect activity – see **Box 1** for more detail concerning our methodology.

Our analysis is also careful to identify where the three different seafood sub-sectors appear in the supply chains of the other sub-sectors. The most obvious example is commercial fishing appearing within the supply chain of processing. Our analysis has isolated the benefits to avoid instances of double counting (see **Appendix 2** for further information concerning the model approach).

BOX 1: INTRODUCING ECONOMIC IMPACT ANALYSIS

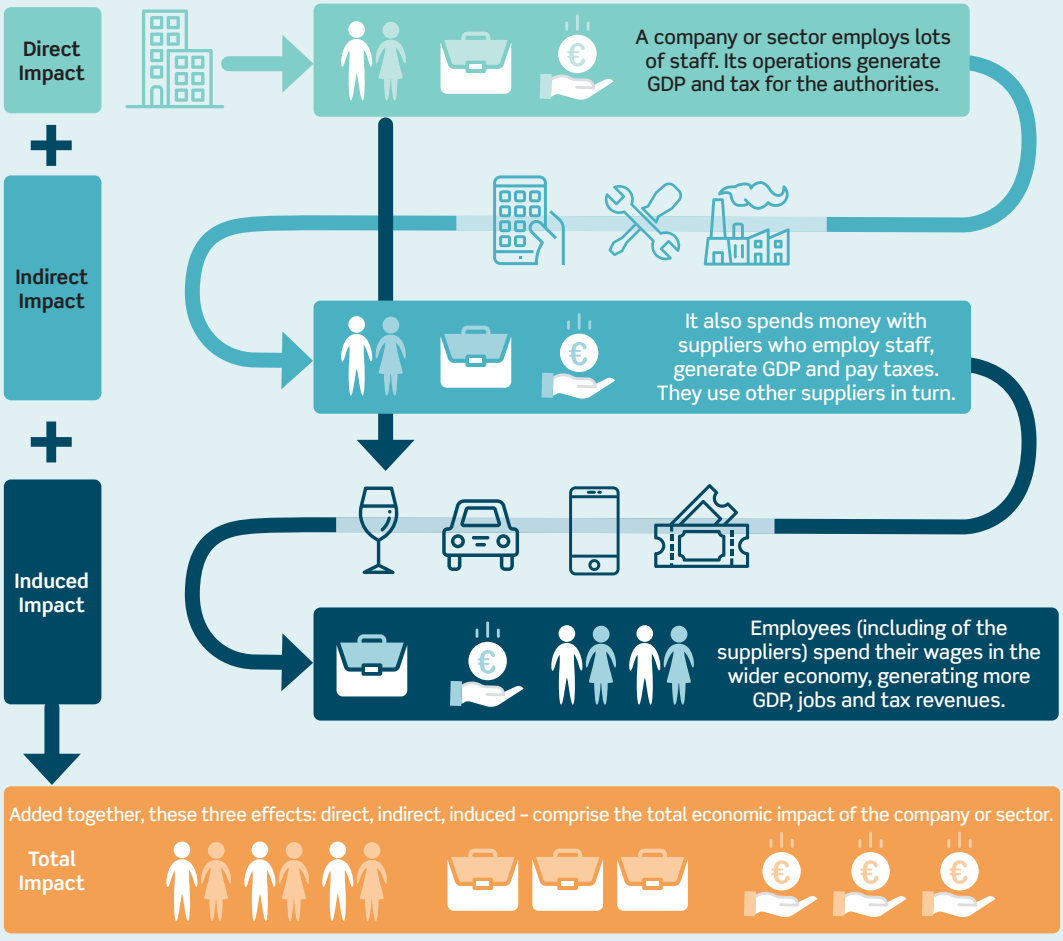
The economic impact of a sector is measured using a standard means of analysis called an economic impact assessment. The report quantifies the three 'core' channels of impact that comprise an organisation/sector's 'economic footprint':

- **Direct impact,** which is the economic activity the seafood sector generates because of its operations;
- **Indirect impact,** or supply chain impact, that occurs because the sector buys inputs of goods and services from Irish businesses; and the
- **Induced impact,** which relates to the wider economic benefits that arise when employees of the local seafood sector and its supply chain spend their wages in the consumer economy, for example, in local retail establishments.

We analyse these channels of impact using three core metrics:

- **Employment,** measured on a Full-Time Equivalent (FTE) headcount basis. This is comprised of both full-time employment and a proportion of part-time working component – where two part-time roles equate to a full-time position;
- **Gross value added** contribution to GDP; and
- **Tax receipts** generated by the Irish activity and employment supported by the seafood sector.

Fig. 3. Economic impact assessment



1.4 Report structure

This report breaks down the characteristics of the collective seafood sector within the port area. It then goes on to show the economic impact this activity creates across the south-west economy.

The report takes the following structure:

- An analysis of the seafood sector within the local port economy;
- A breakdown of the economic benefits associated with the port's seafood sector across the regional economy;
- A summary of the overall benefit associated with the port's seafood sector at the regional level; and
- Finally, we present the report's conclusions.

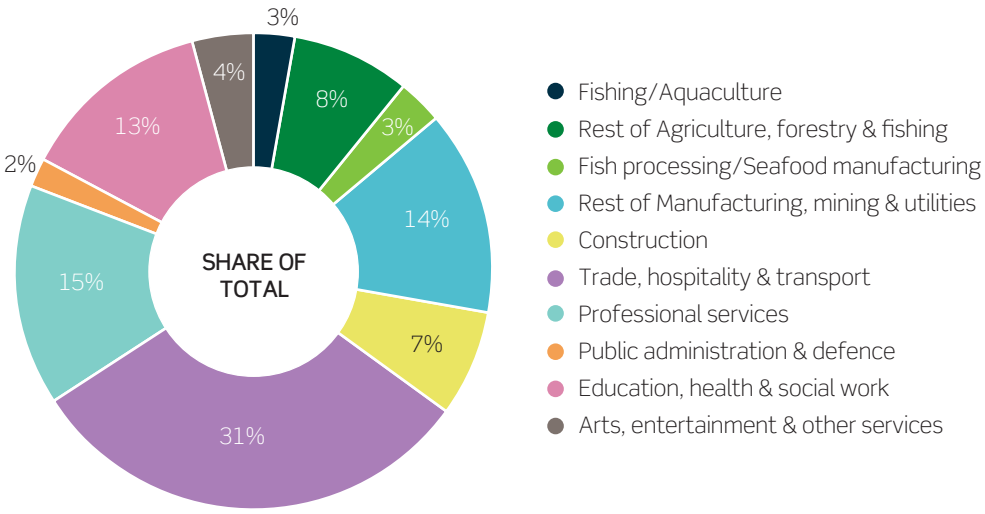
2. The seafood sector at the port

2.1 The importance of the local seafood sector

Before we present the total benefits associated with the port's seafood sector, it is important to first understand the size and characteristics of the sector at the port level – the **direct** activity.

The latest Census (2016) provided workplace employment data at a sectoral level for small area District Electoral Divisions (DEDs) across Ireland. By combining this employment data with our regional productivity estimates we can quantify the economic footprint of the port economy. We estimate that An Daingean's economy made a GVA contribution to GDP of €348 million in 2018.[3] We estimate that the seafood sector within the port represented €18.9 million of this GVA total. Seafood therefore represented 5.4% of the port economy. The largest sectors in GVA terms were the 'trade, hospitality & transport' and 'manufacturing, mining & utilities' sectors which represented 31% and 17% of the local economy respectively.

Fig. 4. GVA by sector, An Daingean, 2018

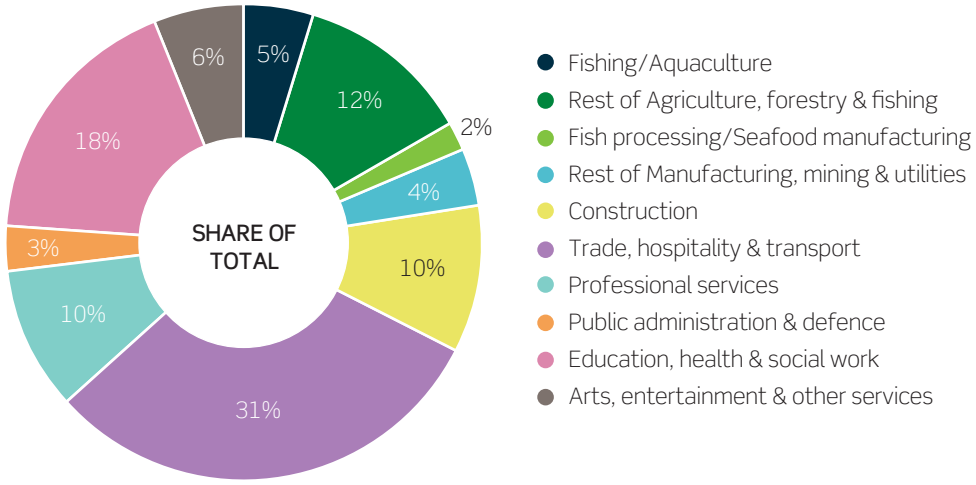


Source: *Oxford Economics, Perceptive Insight, CSO*

In employment terms, seafood is even more important within the port economy. Combined commercial fishing, aquaculture and fish processing is estimated to represent 8% of workplace employment across the port area in 2018. Furthermore, fishing and aquaculture represented 31% of local agriculture, forestry & fishing related employment and fish processing accounted for 37% of local manufacturing, mining & utilities jobs.

3 When estimating the size of the port economies we use the most recent workplace sectoral employment data from the 2016 Census. This employment data relates to workplace zones, which are slightly smaller than DEDs. The workplace zones are therefore mapped across to closely represent the DEDs which cover to the port areas. We then supplement this data with the current snapshot of the local seafood sector as estimated through the survey exercise. Finally, we subtract the commercial fishing and aquaculture activity from the broader 'Agriculture, forestry & fishing' sector to get an indication of its prominence locally. A similar approach is adopted with fish processing in relation to the 'Manufacturing, mining & utilities' sector.

Fig. 5. Employment by sector, An Daingean, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

2.2 Characteristics of the seafood sector

Fish processing forms the largest direct contribution to the seafood sector at An Daingean. In 2018, it accounted for a majority of turnover in this sector (€24.8 million), ahead of commercial fishing (€8.1 million) and aquaculture (€6.3 million). This was despite supporting fewer jobs (100) compared to both the local commercial fishing (110) and aquaculture (115) sub-sectors.

Linked to turnover, average wages also tend to vary by activity. Commercial fishing and aquaculture support lower average wages (€18,300 and €11,200 per worker) relative to fish processing, which offered €29,600 per worker.

BIM's registration data and the survey exercise identified only four operators in the fish processing sub-sector, compared to 45 and 35 for commercial fishing and aquaculture respectively. This highlights the ability of fish processors operating in An Daingean to better exploit the economies of scale associated with industrialised processes.

Fig. 6. Headline direct economic contribution of the seafood sector, An Daingean, 2018

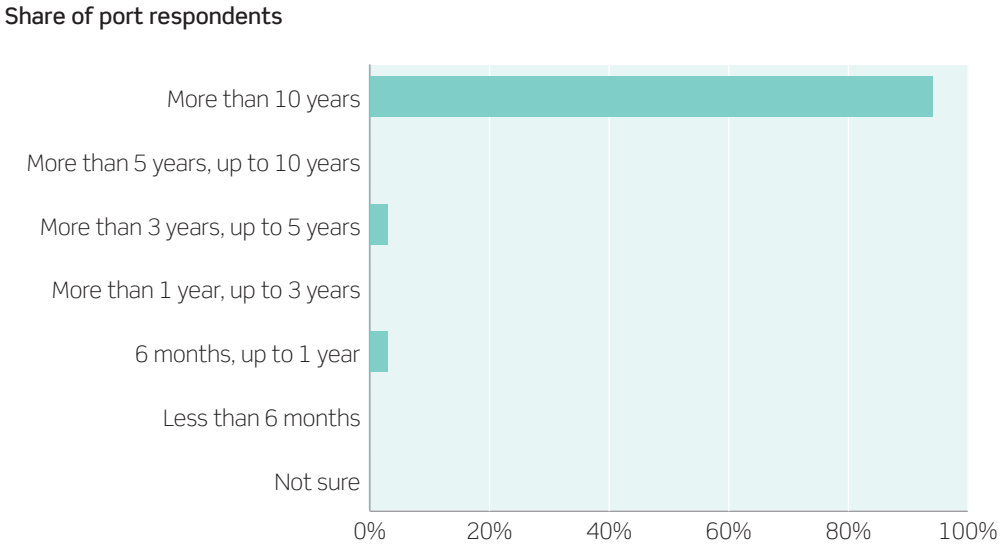
	Turnover (€m)	Jobs	Wages (€m)	Seafood operators
Commercial fishing	8.1	110	2.0	45
Aquaculture	6.3	115	1.3	35
Fish processing	24.8	100	2.9	4
Total	**39.2**	**330**	**6.3**	**84**

Source: *Oxford Economics, Perceptive Insight, BIM*
Note: *May not sum due to rounding*

Our survey also provides insight into the profile of businesses operating at the port. We surveyed 34 seafood operators in An Daingean, 41% of the population of local seafood businesses. While the sample size for An Daingean alone is somewhat smaller than for the ten ports as a whole – the results for which are detailed within the main report – we may nevertheless explore the findings of respondents from the port.

The survey results show that seafood businesses within the port tend to be relatively mature and well established. A significant majority (94%) of respondents identified as having operated for more than 10 years in the port area, a rate slightly above the aggregate figure for the ten ports (89%).

Fig. 7. Seafood sector maturity, An Daingean, 2018

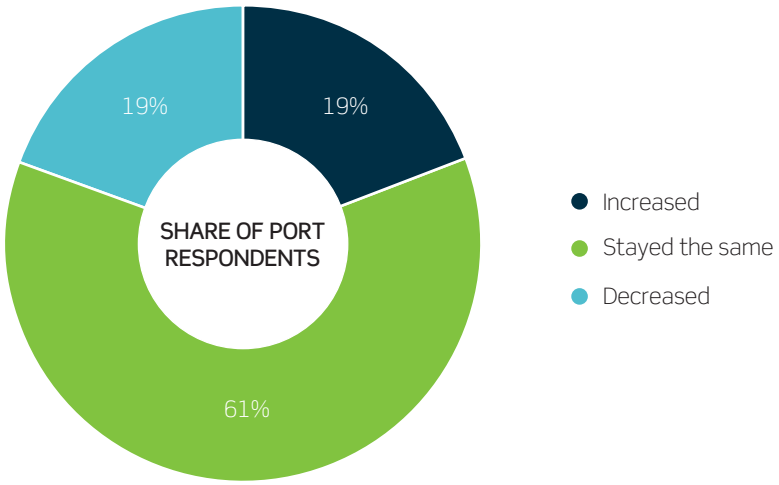


Source: *Oxford Economics, Perceptive Insight*

The survey also explored recent turnover growth among local firms operating in the seafood sector. Overall, turnover growth has been relatively elusive over the past 12 months; over 60% of respondents indicated that turnover had neither increased nor decreased over this period. This share however is below the aggregate rate for all ten ports (72%). The share of respondents who have seen turnover increase (19%) was exactly offset by those who have seen it decrease (19%).

While the sample size of respondents in the separate seafood components is not sufficient to provide an accurate breakdown of turnover performance by all sub-sectors, our survey indicates that over a third of respondents engaged in commercial fishing (35%) saw turnover decrease, compared to just 6% in aquaculture. The latter also appears to be relatively more stable – three in four respondents indicated that turnover stayed the same, compared to under half of commercial fishing operators (47%).

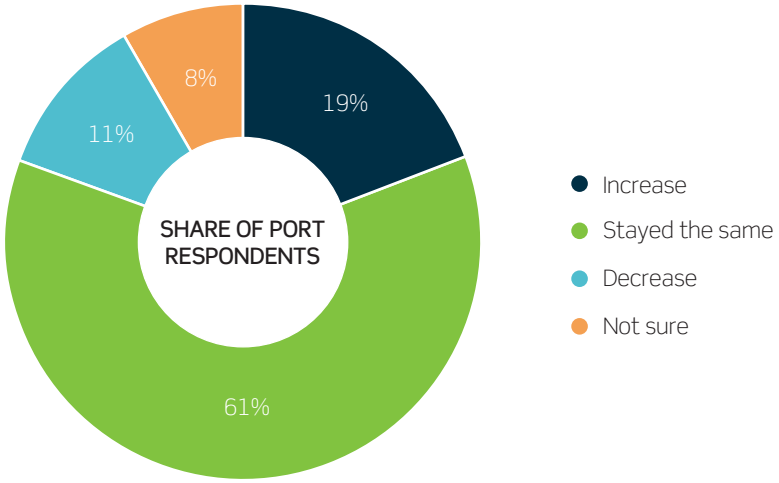
Fig. 8. Changes to turnover in the past 12 months, An Daingean, 2018



Source: *Oxford Economics, Perceptive Insight*

The outlook for firms over the next 12 months is broadly similar to historic performance. The proportion of respondents expecting turnover to stay the same over the next 12 months was similar to that which noted no change over the previous 12 month period (61%). However, a lower share expected a fall in turnover over the next year (11%) when compared against performance over the preceding year (19%).

Fig. 9. Anticipated changes to seafood turnover, An Daingean, 2018

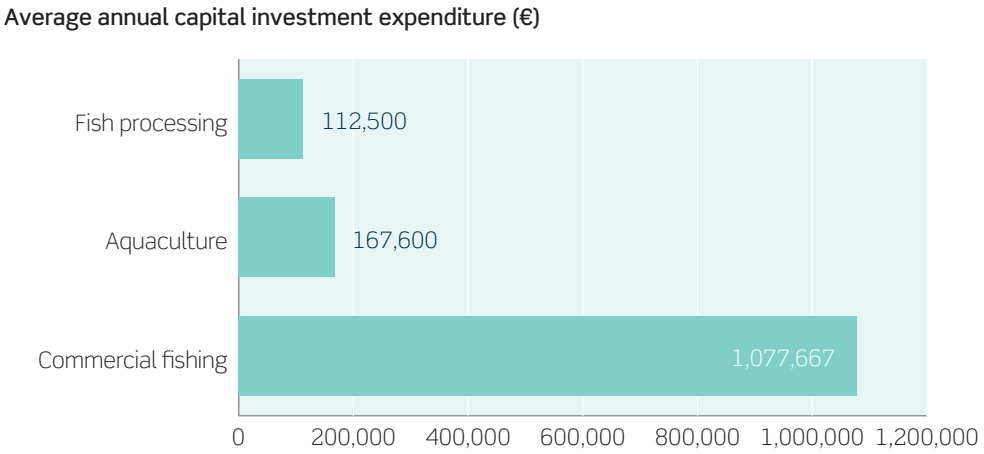


Source: *Oxford Economics, Perceptive Insight*

Improving turnover is often linked to investment: improving the quantity and/or quality of capital available to the workforce can enable improved productivity and turnover. On the one hand, the willingness of firms to engage in capital investment may in itself signal a positive outlook for the future; on the other, it may reflect the deterioration of existing capital stocks. Our survey results hint at the predominance of the latter factor – while 19% of respondents expect turnover to increase over the next year, over a third (36%) have spent money on capital investment in the last financial year.

According to our survey, seafood businesses based at An Daingean spent an average €579,000 on capital investment in 2018. This equates to the second-highest investment level across the ten ports included in the study. Commercial fishing operators tend to be larger in size, and as such invest more on average relative to the other seafood sub-sectors. In 2018, the average commercial fishing business at the port invested over €1 million in capital – over twice the all ports average for this sub-sector (€478,000) – although this finding is subject to a relatively small sample size. By contrast, the average aquaculture and fish processing business in An Daingean invested just €168,000 and €113,000 respectively.

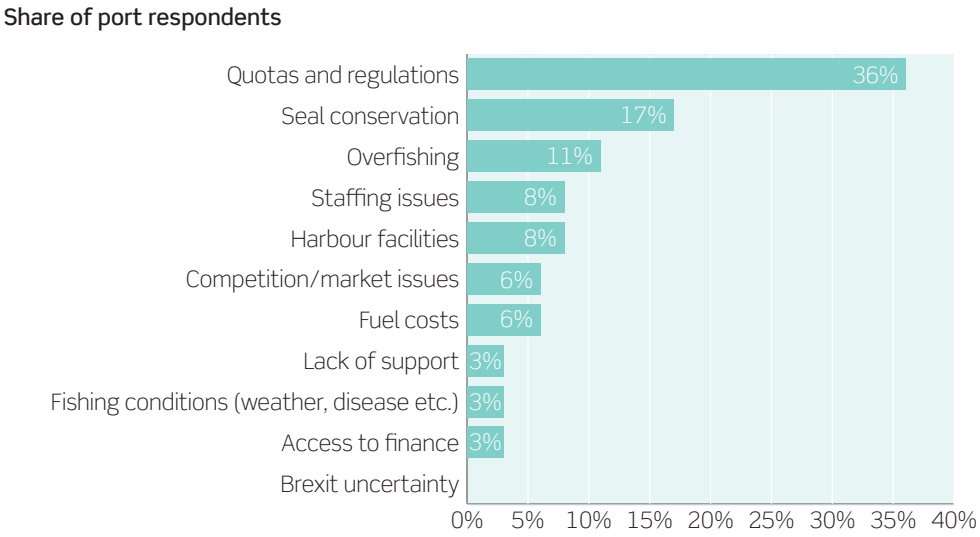
Fig. 10. Average capital investment, An Daingean, 2018



Source: *Oxford Economics, Perceptive Insight*

Given that a majority of firms were not expanding or investing in capital over the past year, our survey also explored the main constraints on growth within the local seafood sector. The results show a considerable variation across different themes. Over a third of respondents identified quotas and regulations as an issue, with 17% identifying seal conservation, and 11% overfishing. Perhaps as a result of the port's geographic location, no respondents cited Brexit uncertainty as the main constraint on growth.

Fig. 11. Main constraint on growth, An Daingean, 2018



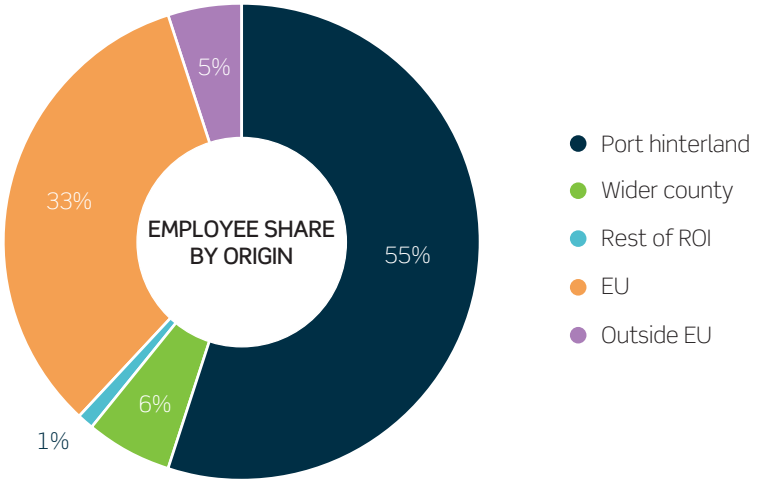
Source: *Oxford Economics, Perceptive Insight*

Alongside demonstrating the importance of the seafood sector in providing local job opportunities, our survey also sought to further understand the characteristics of this workforce – namely where the seafood sector's employees originate from. The survey results highlight that a majority (55%) of workers in the seafood sector originate from the port hinterland, further highlighting the value of the seafood sector at An Daingean to the local population. A further 6% of workers also originate from county Kerry. Just over a third (38%) were foreign nationals, mostly originating from the EU (33%).

Fish processing activities at the port are more likely to employ workers from abroad. Over two-thirds (69%) of the workforce originated from outside of Ireland, including 58% from the EU. Only 26% of the workforce originated from the port hinterland, a share significantly lower than for either aquaculture (92%) or commercial fishing (70%).

Given that a majority of the workforce originate from the port hinterland, or the rest of the county, we also find that the workforce tends to also live locally. Almost the entire workforce (98%) reside within the county, while 92% also live in the port hinterland itself.

Fig. 12. Origins of the workforce, An Daingean, 2018

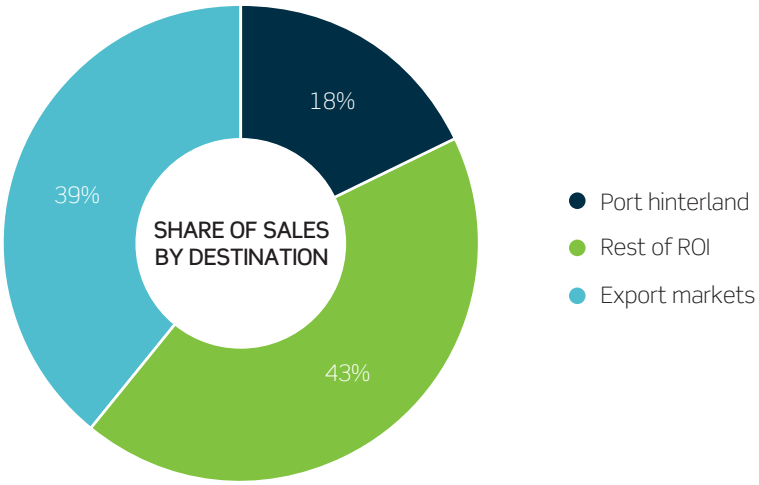


Source: *Oxford Economics, Perceptive Insight*

Our survey also explored the destinations of sales made by seafood sector firms. Exports accounted for 39% of the total in An Daingean, a share only slightly below the ten ports combined share (45%). Although the sample size is relatively low, a significant majority of exports were made to the EU.

By contrast, only 18% of sales were made in the port hinterland – the second lowest of the ten ports – and 15 percentage points below the ports average (33%). The remaining 43% of sales were made elsewhere in Ireland, again, the second highest rate across all ports.

Fig. 13. Seafood sales by destination, An Daingean, 2018



Source: *Oxford Economics, Perceptive Insight*

2.3 Conclusion

The sector directly employs an estimated 330 people and almost the entire workforce (98%) reside within the county, with 92% living in the port hinterland itself.

Like most other ports in the survey, the bulk of respondents reported that turnover had remained broadly unchanged over the past 12 months. However, nearly one-fifth reported experiencing an increase. In addition, capital investments over the last year were among the highest of those recorded across the 10 ports studied.

When asked about barriers to growth, quotas and regulations were the most common constraint to growth given by port respondents, while Brexit uncertainty was only notable by its lack of mention.

3. The impact of seafood's sub-sectors

In this section, we estimate the wider economic contribution An Daingean's seafood sector has on the regional economy.

3.1 Commercial fishing

We estimate that commercial fishing at An Daingean generated €7.5 million of GVA across the south-west economy in 2018. Over a third of this GVA total (€2.5 million) was not directly generated by commercial fishing activity within the port area itself but resulted from the associated supply chain activities (€1.5 million) and consumer spending in the regional economy (€1.0 million).

Commercial fishing activity is estimated to support 135 jobs throughout the regional economy. A large proportion of these jobs (110) are associated with direct fishing activity within the port area. This direct activity supports €2 million in earnings across the south-west and rises to €3 million after we include the employment sustained through the rounds of supply chain procurement and the consumer spending impacts. The indirect and induced effects tend to occur in relatively higher value-added sectors, generating more GVA per worker on average – and higher average wages – than direct activities at the port.

Fig. 14. Benefits of the commercial fishing sub-sector, South-West, 2018

Port commercial Fishing	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	4.9	110	2.0
Indirect	1.5	15	0.5
Induced	1.0	15	0.5
Total	**7.5**	**135**	**3.0**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The Agriculture, forestry & fishing sector accounted for two-thirds of the GVA total generated within the region by commercial fishing, equivalent to €5 million in 2018 (see **Fig. 15**). Agriculture, forestry & fishing's overall GVA contribution was therefore only slightly above that of its direct contribution (€4.9 million), implying that the sector generates relatively few indirect or induced benefits throughout the rest of the regional economy.[4] It however remains the main beneficiary in employment terms, supporting 115 jobs in 2018, or 82% of the regional total, alongside €2.1 million in wages.

Of the impact of commercial fishing on other sectors, Wholesale & retail received the largest GVA contribution (€0.8 million) – being among the stronger beneficiaries of consumer spending throughout the south-west economy, while Manufacturing (€0.4 million) receives the next largest contribution, as a result of its more prominent role within commercial fishing's supply chain.

4 Commercial fishing and aquaculture activity are classified within the 'Agriculture, forestry & fishing' sector. Whereas, fish processing falls within the 'Manufacturing' sector.

Fig. 15. Total benefits of commercial fishing by sector, South-West, 2018

Port commercial fishing	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	5.0	115	2.1
Mining & quarrying	0.0	0	0.0
Manufacturing	0.4	<5	0.0
Electricity, gas, steam	0.0	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	0	0.0
Wholesale & retail	0.8	10	0.4
Transportation & storage	0.2	<5	0.1
Accommodation & food	0.1	5	0.1
Information & communications	0.0	0	0.0
Financial & insurance	0.1	<5	0.0
Real estate	0.3	<5	0.1
Professional, scientific & technical	0.2	<5	0.1
Administration & support	0.0	0	0.0
Public administration	0.0	0	0.0
Education	0.1	<5	0.1
Human health	0.1	<5	0.1
Arts, entertainment & recreation	0.0	0	0.0
Other service activities	0.0	<5	0.0
Total	**7.5**	**135**	**3.0**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not add due to rounding*

3.2 Aquaculture

In total, the port's aquaculture sub-sector supported 135 jobs, €2.1 million in wages and a €5.7 million contribution to GDP throughout the south-west in 2018. Approximately,115 of these jobs were associated with direct aquaculture related activity taking place with the port area itself, while an additional 20 jobs resulted from the supply chain and consumer spending related impacts. Aquaculture's employment multiplier was estimated to be only slightly weaker than that of the commercial fishing sub-sector (1.18 vs 1.23 respectively), with 1 direct job supporting 0.18 jobs elsewhere within the south-west region.

Fig. 16. Benefits of the aquaculture sub-sector, South-West, 2018

Port aquaculture	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	3.8	115	1.3
Indirect	1.2	10	0.4
Induced	0.7	10	0.3
Total	**5.7**	**135**	**2.1**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

Employment supported by aquaculture activities at the port is almost entirely concentrated within the agriculture, forestry & fishing sector. Agriculture, forestry & fishing (120 jobs) alone accounts for 88% of the overall employment benefit, with the next largest beneficiary being wholesale & retail (5 jobs). Agriculture, forestry & fishing however only accounts for two-thirds of the wage benefits (€1.4 million) and a similar share of GVA (€3.9 million).

Fig. 17. Total benefits of aquaculture by sector, South-West, 2018

Port aquaculture	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	3.9	120	1.4
Mining & quarrying	0.0	0	0.0
Manufacturing	0.3	<5	0.0
Electricity, gas, steam	0.0	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	0	0.0
Wholesale & retail	0.5	5	0.2
Transportation & storage	0.2	<5	0.1
Accommodation & food	0.1	<5	0.1
Information & communications	0.0	0	0.0
Financial & insurance	0.1	0	0.0
Real estate	0.3	<5	0.1
Professional, scientific & technical	0.2	<5	0.1
Administration & support	0.0	0	0.0
Public administration	0.0	0	0.0
Education	0.0	<5	0.0
Human health	0.1	<5	0.0
Arts, entertainment & recreation	0.0	0	0.0
Other service activities	0.0	0	0.0
Total	**5.7**	**135**	**2.1**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not add due to rounding Fish processing*

The fish processing sub-sector at An Daingean supported 170 jobs, €15.6 million of GVA and €5.4 million in wages throughout the south-west in 2018. Of the 70 additional jobs that do not belong to the sub-sector at the port itself, 50 are supported throughout the supply chain, while a further 20 are as a result of spending supported by those employed either directly or indirectly. Fish processing employment multiplier was the strongest of the three seafood sub-sectors at 1.7 – with every direct fish processing job supporting 0.7 jobs throughout the rest of the regional economy.

Fig. 18. Benefits of the fish processing sub-sector, South-West, 2018

Fish processing	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	10.1	100	2.9
Indirect	3.7	50	1.6
Induced	1.7	20	0.8
Total	**15.6**	**170**	**5.4**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

The south-west's Manufacturing sector benefits most from fish processing activity at An Daingean. In 2018, it supported €10.7 million of GVA, equivalent to two-thirds of the sub-sector's total in the south-west, and 100 jobs. The proportionate share of wages (€3 million) is, however, just over half of the fish processing total, while Agriculture, forestry & fishing (€0.8 million) supports just under a fifth of the total. This is despite generating just €1.6 million of GVA, and supporting 30 jobs. The Wholesale & retail sector is the next largest benefactor of An Daingean's fish processing sub-sector, generating €0.9 million of GVA within the regional economy.

Fig. 19. Total benefits of fish processing by sector, South-West, 2018

Ports processing	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	1.6	30	0.9
Mining & quarrying	0.0	0	0.0
Manufacturing	10.7	100	3.0
Electricity, gas, steam	0.1	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	<5	0.0
Wholesale & retail	0.9	10	0.4
Transportation & storage	0.6	5	0.3
Accommodation & food	0.2	5	0.1
Information & communications	0.0	0	0.0
Financial & insurance	0.2	<5	0.1
Real estate	0.5	5	0.2
Professional, scientific & technical	0.3	5	0.1
Administration & support	0.1	0	0.0
Public administration	0.0	0	0.0
Education	0.1	<5	0.1
Human health	0.1	5	0.1
Arts, entertainment & recreation	0.0	<5	0.0
Other service activities	0.0	<5	0.0
Total	**15.6**	**170**	**5.4**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

3.3 Conclusion

All three of the port seafood sub-sectors represent significant value to the regional economy. In employment terms, they individually support over 130 jobs in the south-west after accounting for their direct, indirect and induced impacts. Fish processing is the largest of the three in purely GVA terms. Its direct value added is more than that of aquaculture and commercial fishing combined and it supports an estimated €15.6 million of GVA throughout the wider region.

4. Total impact of the overall port seafood sector

4.1 Seafood sector activity at the port

This section takes the estimates presented in the preceding sections of the report and calculates the total economic impact resulting from the activities of the seafood sector within the port area.

However, simply summing the respective benefits of all three elements (commercial fishing, aquaculture and fish processing) will inevitably overestimate the indirect, induced and as a result, total impacts. This is because the supply chains of the fish processing element contain a proportion of the commercial fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would result in double-counting some of the impacts. See **Appendix 2** for further detail on our approach.

We have therefore laid out the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts:

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment, wages and tax.

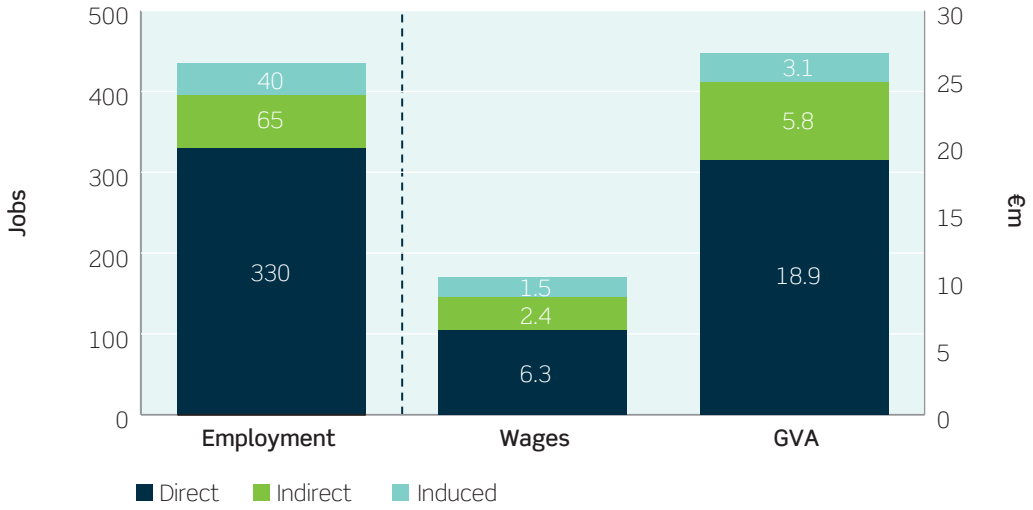
Indirect and induced impacts:

- For GVA, employment, wages and taxes, the total indirect and induced impacts are calculated by summing the indirect and induced impacts of fish processing and a 80% and 76% share of the indirect and induced impacts from the respective aquaculture and commercial fishing sub-sectors (as information from the survey interviewees suggest that exports and domestic sales outside the port areas own processors account for 80% and 76% of the respective aquaculture and fishing production). The remainder of the commercial fishing/aquaculture sub-sectors' indirect and induced impacts will already be accounted for in the indirect and induced impacts from the fish processing sub-sector.

4.2 Regional estimates

We estimate that the seafood sector at An Daingean contributed €27.7 million of GVA to the south-west economy in 2018. The seafood sector supported 430 jobs across the region, generating €10.1 million in wages for those employed.

Fig. 20. Benefits of the seafood sector, South-West, 2018



Source: *Oxford Economics, Perceptive Insight, CSO*

Around a third of the GVA total (€8.9 million) is generated either in indirect activities supporting the local seafood sector (€5.8 million) or through additional induced spending that results from the employment supported by the sector and its supply chain (€3.1 million). As a whole, the port's seafood sector is estimated to have a GVA multiplier of 1.5, meaning that for every €1 GVA contribution to GDP, a further €0.5 is generated within the regional economy.

Fig. 21. Total seafood sector benefits, South-West, 2018

Ports seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Direct	18.9	330	6.3
Indirect	5.8	65	2.4
Induced	3.1	40	1.5
Total	**27.7**	**430**	**10.1**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

In GVA terms, the Manufacturing sector benefits most from An Daingean's seafood sector. It supported €11.3 million of GVA across the south-west in 2018, equivalent to 41% of local seafood's total contribution across the region. However, relatively high productivity within the sector means that Manufacturing only accounts for a quarter of the employment benefits (100 jobs).

By contrast, Agriculture, forestry & fishing accounts for a lower share of GVA (38%) relative to Manufacturing but supports a larger employment total; 260 jobs in this sector equating to 61% of the total in the south-west – more than twice the number of jobs supported in Manufacturing. Agriculture, forestry & fishing also represents the largest share of earnings generated by the seafood sector (€4.3 million).

Wholesale & retail is the next largest beneficiary in GVA terms (€1.9 million), supporting an estimated 25 jobs, followed by Real estate (€0.9 million) and Transportation & storage (€0.8 million).

Fig. 22. Total benefits by sector, South-West, 2018

Local seafood sector	South-West		
	GVA (€m)	Employment	Wages (€m)
Agriculture, forestry & fishing	10.4	260	4.3
Mining & quarrying	0.0	0	0.0
Manufacturing	11.3	100	3.1
Electricity, gas, steam	0.1	0	0.0
Water supply	0.0	0	0.0
Construction	0.0	<5	0.0
Wholesale & retail	1.9	25	0.9
Transportation & storage	0.8	10	0.4
Accommodation & food	0.3	10	0.2
Information & communications	0.1	0	0.0
Financial & insurance	0.3	<5	0.1
Real estate	0.9	5	0.3
Professional, scientific & technical	0.6	5	0.3
Administration & support	0.1	<5	0.0
Public administration	0.0	<5	0.0
Education	0.2	5	0.2
Human health	0.3	5	0.2
Arts, entertainment & recreation	0.1	<5	0.0
Other service activities	0.1	<5	0.1
Total	**27.7**	**430**	**10.1**

Source: *Oxford Economics, Perceptive Insight, CSO*
Note: *May not sum due to rounding*

4.3 Taxation estimates

Seafood activity at the port provides further benefits through the generation of tax revenues to the Revenue Commissioners. These fiscal impacts can again be split into their direct, indirect and induced components depending on what channel of activity they originate from. We estimate that the port seafood sector's direct tax contribution equated to €2.5 million in 2018, consisting of both the labour-based tax paid by the sector's employees (income tax, PRSI etc) and corporation tax receipts.

The indirect fiscal benefits represent the same taxation components as above but are generated within the sector's wider supply chain, in addition to net taxes on input purchases and sectoral taxation on production less subsidies. Combined these represent a net fiscal deficit of €0.4 million, mainly because of Agriculture, forestry & fishing's prominence within the fish processing supply chain. However, the indirect deficit is more than compensated for by the consumption related tax the sector supports across the economy. As those employed in the sector and within its supply chain spend their wages, this supports further jobs and activity within the Irish economy. We estimate this induced activity supported a further €1.9 million in tax revenue.

Therefore, in total, An Daingean's seafood sector is estimated to have supported €4 million in fiscal benefits in 2018. This total was made up of €3.2 million in employment/labour related tax, €0.7 million in corporation tax, €1.2 million in taxation associated with the spending of wages, and a net tax deficit of €1 million through taxation on inputs and production.[5]

5 Net tax position refers to taxes less subsidies.

Fig. 23. Fiscal impact by taxation type, Ireland, 2018

Ports seafood sector	Total tax estimates (€m)				
	Labour tax	Corporation tax	Production tax	Input purchases tax	Tax on consumption
Agriculture, forestry & fishing	1.4	0.2	-1.8	0.2	0.0
Mining & quarrying	0.0	0.0	0.0	0.0	0.0
Manufacturing	1.1	0.2	0.0	0.0	0.9
Electricity, gas, steam	0.0	0.0	0.0	0.0	0.0
Water supply	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0
Wholesale & retail	0.1	0.1	0.0	0.0	0.0
Transportation & storage	0.1	0.0	0.1	0.2	0.0
Accommodation & food	0.1	0.0	0.0	0.0	0.1
Information & communications	0.0	0.0	0.0	0.0	0.0
Financial & insurance	0.0	0.1	0.0	0.1	0.0
Real estate	0.1	0.0	0.1	0.0	0.0
Professional, scientific & technical	0.1	0.0	0.0	0.0	0.0
Administration & support	0.0	0.0	0.0	0.0	0.0
Public administration	0.0	0.0	0.0	0.0	0.0
Education	0.1	0.0	0.0	0.0	-0.1
Human health	0.1	0.0	0.0	0.0	0.0
Arts, entertainment & recreation	0.0	0.0	0.0	0.0	0.0
Other service activities	0.0	0.0	0.0	0.0	0.0
Total	**3.2**	**0.7**	**-1.6**	**0.6**	**1.2**

Source: *Oxford Economics, Perceptive Insight, CSO*

4.4 Conclusion

Our analysis shows that the seafood sector at An Daingean supports 430 jobs, €10.1 million in wages and €27.7 million in GVA. Furthermore, this activity is estimated to support €4 million in tax revenues towards the public purse.

5. Conclusions

5.1 The seafood sector at the port

The seafood sector makes an important contribution to the An Daingean economy. In 2018, the seafood sector at the port generated €39 million in turnover, supporting 330 direct jobs and represents 5.4% of the port area economy in GVA terms. Fish processing is the largest seafood sub-sector at the port, generating €24.8 million in turnover, followed by commercial fishing (€8.1 million) and aquaculture (€6.3 million). When translated into GVA, the overall seafood sector makes a €18.9 million direct contribution to the local port area economy.

Our survey explores the characteristics of firms operating in this sector. In general, firms are typically well-established, having operated for more than 10 years, and turnover tends to be relatively stable year-on-year. Seafood businesses at An Daingean typically invest more in capital relative to the other ports included within the study, particularly in the commercial fishing sub-sector. The workforce tends to originate from the local area, and although two-fifths of sales are exports, the end-market for seafood produce tends to be more domestically focussed than at other ports in Ireland.

5.2 The fish processing sub-sector is the main contributor

The fish processing sub-sector makes the strongest contribution to the South West economy. In 2018, it alone generated €15.6 million of GVA, of which €5.4 million is linked to indirect (€3.7 million) and induced (€1.7 million) effects. The fish processing sector also enjoys the strongest employment multiplier of the three seafood sub-sectors, with every two direct fish processing jobs supporting one additional job with the south-west region. The fish processing sub-sector is estimated to provide benefits of the following size:

- 100 direct jobs and €2.9 million of wages, producing €10.1 million of GVA;
- 50 indirect jobs and €1.6 million of wages, producing €3.7 million of GVA; and
- 20 induced jobs and €0.8 million of wages, producing €1.7 million of GVA.

5.3 Though the remaining components remain significant

Although the commercial fishing sub-sector generates less direct GVA than the fish processing sector its GVA multiplier was similar to that of fish processing, thereby boosting its total GVA impacts. Accordingly, our analysis shows the economic impact of the commercial fishing element was of the following size in 2018:

- 110 direct jobs and €2.0 million of wages, producing €4.9 million of GVA;
- 15 indirect jobs and €0.5 million of wages, producing €1.5 million of GVA; and
- 15 induced jobs and €0.5 million of wages, producing €1.0 million of GVA.

Furthermore, our analysis shows that the economic impact of the port's aquaculture sector equates to the following benefits across the south-west economy:

- 115 direct jobs and €1.3 million of wages, producing €3.8 million of GVA;
- 10 indirect jobs and €0.4 million of wages, producing €1.2 million of GVA; and
- 10 induced jobs and €0.3 million of wages, producing €0.7 million of GVA.

Therefore, we estimate that the port's collective seafood sector supported 420 jobs, €8.5 million in wages and €18.1 million in GVA within the regional economy in 2018. This activity was enough to sustain €3.7 million in tax revenues towards the public accounts.

5.4 Seafood sector supporting peripheral economies

Although the port area's unemployment rate is relatively low, this masks above average rates of economic inactivity relative to the national average. The data also suggests that local employment opportunities may be limited with prominent flows of net out-commuting alongside relatively weak population growth – especially among those of working age.

Agriculture, forestry & fishing forms a relatively large proportion of economic activity within the local port economy, driven to an extent by activities in the seafood sector at the port. The local port economy is also characterised by sectors linked to tourism activity – such as trade, hospitality & transport and arts, entertainment & other services. However, given a relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term.

As a result, the seafood sector is likely to continue to play an important role in the local port economy through its provision of accessible direct jobs, supply chain spending in local businesses and the consumers spending it supports. Looking forward, a vibrant and growing local seafood sector is likely to remain a prominent asset for the local economy.

Appendix 1: An Daingean's economic challenges

Economic activity and structure

The latest available data indicates that An Daingean's labour market is performing relatively strongly. The local unemployment rate within the port area and its hinterland was relatively low at 10.7% in 2016.[6] The unemployment rate throughout the south-west region and Ireland overall was 11.0% and 12.9% respectively in the same year.

The local employment rate of 53.8% was also relatively stronger than both the regional and national averages (see **Fig. 24**). Furthermore, Census data reveals that the economic inactivity rate[7] among those residents aged 15 and over stood at 39.7% in 2016. Local inactivity was therefore lower than the south-west (40.4%), but higher than the national (38.8%) average.

Fig. 24. Headline economic indicator comparisons, 2016

	Unemployment rate	Employment rate	Economic inactivity
An Daingean	10.7%	53.8%	39.7%
South-West	11.0%	53.0%	40.4%
Ireland	**12.9%**	**53.3%**	**38.8%**

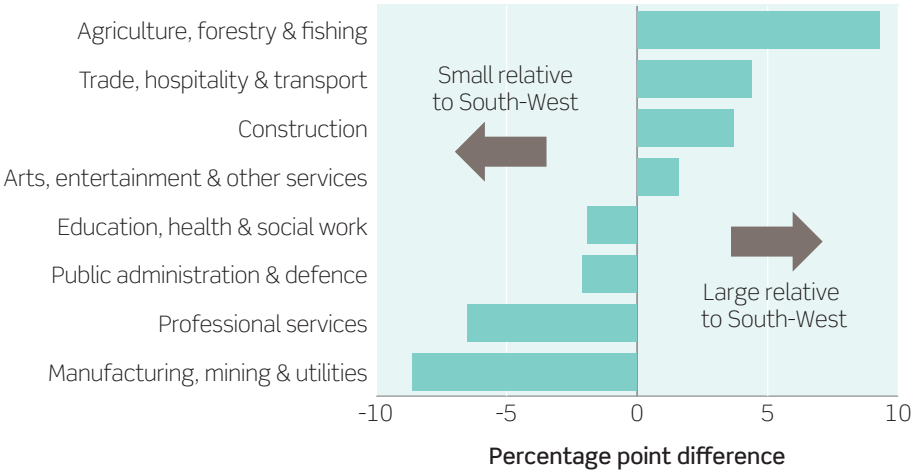
Source: *CSO*

The latest Census in 2016 showed there were close to 4,900 people employed within the port area and its hinterland. Meanwhile, there were close to 8,300 residents of the area employed in jobs based either in the local port economy or elsewhere. The difference represents the degree of net out-commuting of people who live locally, taking up employment opportunities outside the port area.

A sectoral breakdown of workplace employment within the port area and its hinterland points to the importance of the local seafood sector. The data shows that workplace employment within the Agriculture, forestry & fishing and Manufacturing, mining & utilities sectors collectively account for 23% of the total.[8] Although the Manufacturing, mining & utilities share of employment lags the regional economy, the Agriculture, forestry & fishing sector's share of local employment was over twice the regional average (see **Fig. 25**).

6 Defined as a share of the labour force aged 15 years and over.
7 Economic inactivity represents the share of the population aged 15 and over who were neither employed nor looking for employment.
8 Commercial fishing and aquaculture fall within the 'Agriculture, forestry & fishing' sector. Fish processing related activity is classified within the industry grouping of 'Manufacturing, mining & utilities'.

Fig. 25. Employment share differences, An Daingean vs region, 2016



Source: *Oxford Economics, CSO*

Demographics

The port area and hinterland's population has grown by 1.8% in the five years between 2011 and 2016, a rate below that of both the regional (3.2%) and national averages (3.8%). At the same time the number of residents aged 15 to 64 actually fell by 1.9%, meanwhile at the national level this cohort increased by 1.4%. As a result, the working age component of the population is relatively low, standing at just 63.8% in 2016, below both the regional and national averages.

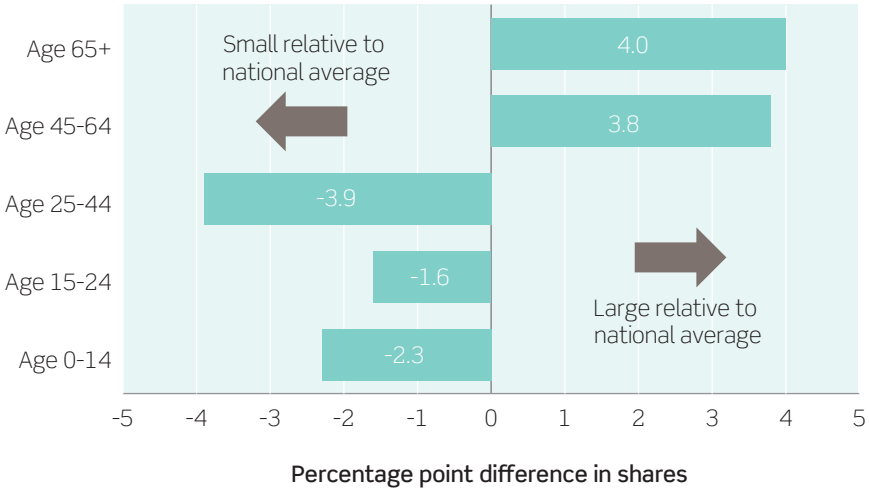
Fig. 26. Population indicators, 2016

	Growth (2011-16)		2016	
	Population	Working age	Population	Working age share
An Daingean	1.8%	-1.9%	19,000	63.8%
South-West	3.2%	0.5%	683,200	65.2%
Ireland	**3.8%**	**1.4%**	**4,761,900**	**65.5%**

Source: *CSO*
Note: *Working age is defined as those aged between 15 and 64*

An analysis of port area's population by age cohorts relative to the national picture shows that the distribution is skewed at both the younger and older ends. Those aged 65 and over accounted for close to 17% of all residents – four percentage points above the national average in 2016. Likewise, younger working age people (aged 25-44) were underrepresented, representing a share of the local population which was close to four percentage points below the national average in 2016.

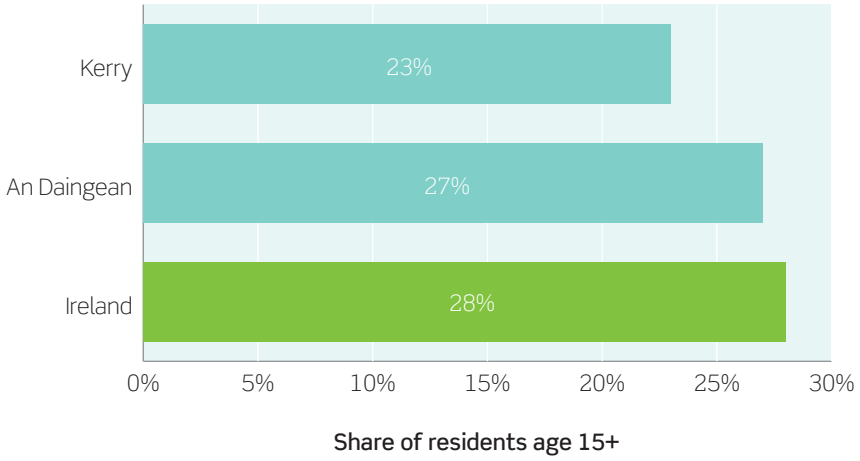
Fig. 27. Age group comparisons, Port area vs Ireland, 2016



Source: *CSO Ireland*

Although qualification attainment within the port area tends to be slightly stronger than the broader county, it remains weaker than that of national average. Those educated to degree level or above accounted for 27% of the population aged 15 and above in An Daingean – below the national average of 28%. Those with no formal qualifications or at most primary level education similarly represented 12.6% of residents aged 15 and over in 2016. Although this share was lower than the county Kerry average (13.4%), it remained above the national average (12%).

Fig. 28. Degree level or above attainment, 2016



Source: *CSO*

Summary

Although the port area's unemployment rate is relatively low, this masks above average rates of economic inactivity relative to the national average. The data also suggests that local employment opportunities may be limited with prominent flows of net out-commuting alongside relatively weak population growth – especially among those of working age.

Agriculture, forestry & fishing forms a relatively large proportion of economic activity within the local port economy, driven to an extent by activities in the seafood sector at the port. The local port economy is also characterised by sectors linked to tourism activity – such as trade, hospitality & transport and arts, entertainment & other services. However, given a relatively small professional services sector (which is typically the fastest growing in employment terms), the local port economy is unlikely to experience significant job creation in the short-term.

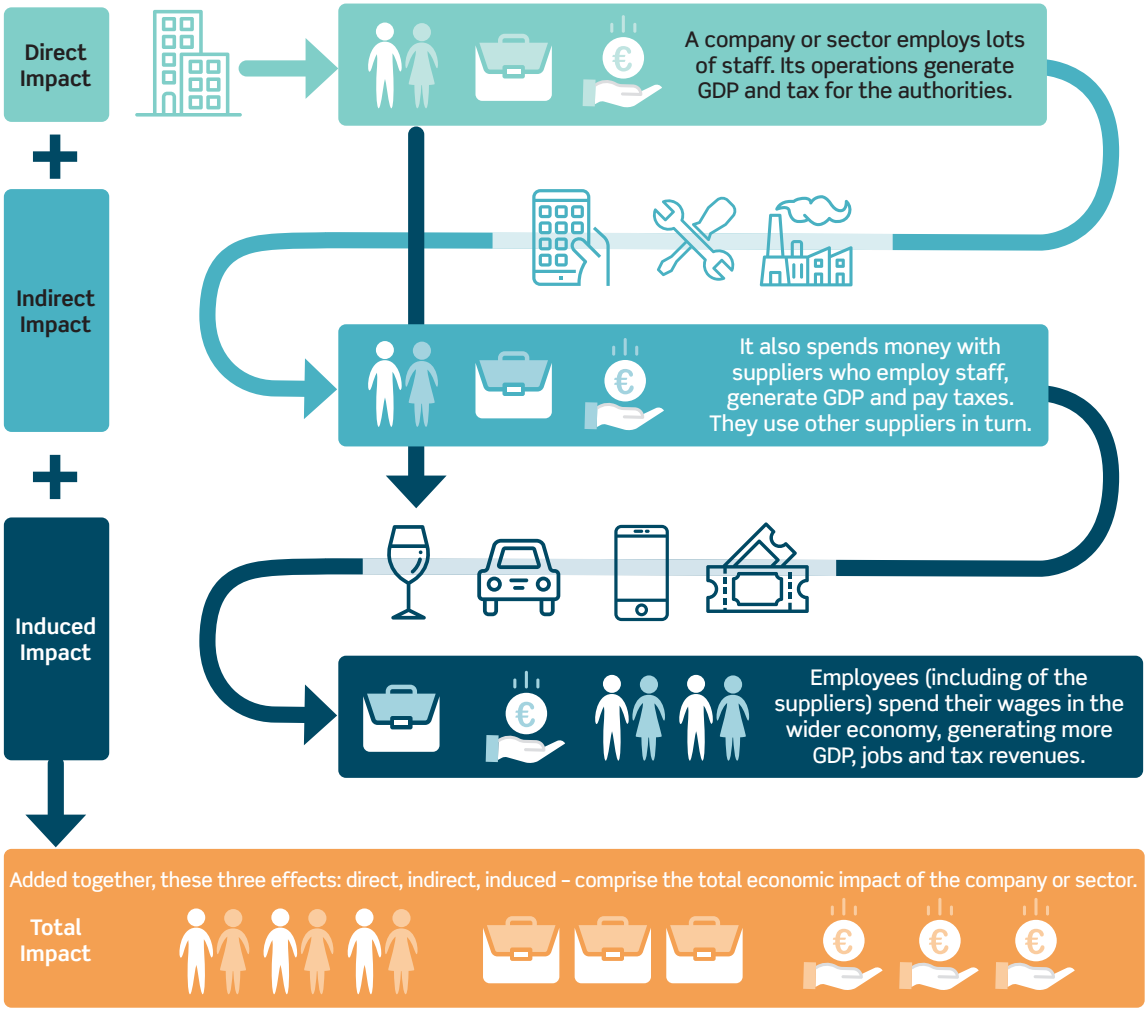
As a result, the seafood sector is likely to continue to play an important role in the local port economy through its provision of accessible direct jobs, supply chain spending in local businesses and the consumers spending it supports. Looking forward, a vibrant and growing local seafood sector is likely to remain a prominent asset for the local economy.

Appendix 2: Model approach

Understanding economic impact assessments

An economic impact assessment quantifies the total economic benefit created by a sector through a range of different channels. For the seafood sector at the ports this arises in four main ways. The first three are the standard channels through which economic impact is usually quantified: direct operational effects, supply chain effects, and the impact of employees spending their wages in the wider consumer economy. The fourth channel, known as 'catalytic' or 'dynamic' benefits represent the wider benefits that society and/or other industries derive from the original economic activity.

Fig. 29. Overview of economic impact methodology



Our report uses three main metrics to quantify each of the channels by which the seafood sector could contribute to the regional[9] and national economy:

- **Gross value-added** contribution to Gross Domestic Product (GDP)[10]: This measured the value of goods and services produced in an area, industry or sector of an economy and is equal to output minus intermediate consumption;
- **Employment:** Employment is presented in terms of full-time equivalent jobs as defined in the report, the combination of workplace employment by full-time and part-time status; and
- **Wages** is the total value of remuneration offered to the workers associated with the local seafood sector.

All the data used was either provided by BIM (for example recent seafood operator registrations/industry data), the seafood sector survey carried out by Perceptive Insight or published government website data and industry standards from the likes of CSO Ireland and Oxford's own economic databases. Finally, in the absence of data, reasonable assumptions based on best judgement are clearly rationalised in the study. For example, in the absence of port specific data we will use published sources for comparator geographies as a proxy estimates were appropriate.

Estimating the direct economic contribution

The first step was to understand the direct activity associated with the local seafood sector at each of the 10 ports in 2018.

The survey

The Seafood survey was designed to provide the evidence base from which to estimate the local seafood sector's contribution to the regional/national economy. Responses from the sector were analysed according to common characteristics (sub-sector, turnover band, main port area etc) and cross-referenced with the most recent full snapshot of the local seafood sector population.[11]

Sample estimates were then 'grossed' up to that of the total population. This was done by drawing on the BIM database of the seafood sector population in each port which contained fields on sector and turnover bands. Knowing indicative turnover levels for seafood businesses not captured in the survey, we were able to apply the average ratio of jobs to turnover level in that sector and apply average sectoral wages, etc. In other words we utilised knowledge of the sectors and turnover of the missing companies and applied the ratios and averages of those covered in the survey to estimate their activity. The resulting total seafood related turnover estimate is then split into the different sectors of the economy ('Agri, forestry & fishing' and 'Manufacture of food products').

This turnover figure is essentially the value of output within the local seafood sector and encompasses intermediary demand, wages and profits. Using the sectoral ratios of output to GVA in the Irish input-output tables we estimated the direct sectoral GVA contributions to GDP in the local economy. Both direct employment and gross wages paid within the local port seafood sector are again informed by the survey findings and grossed to the population total based on shared characteristics.

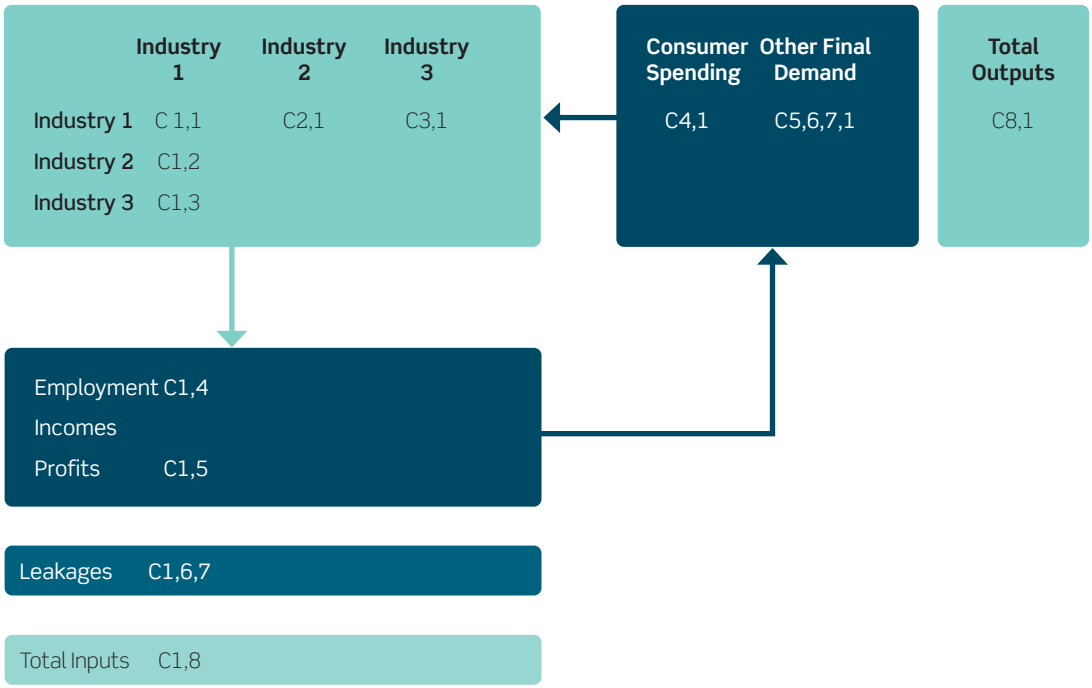
With our estimate of direct output and wages, we then applied sectoral taxation assumptions and calculated the resulting fiscal benefits that would likely be collected by the Revenue Commissioners.

9 Ideally, we would quantify the impacts of the seafood sector on the port area, however, there is not enough published sectoral employment, GDP and wage data. Sufficient data is only available at regional level to produce sub-national impacts.
10 GDP is the main summary indicator of economic activity in Ireland. GDP can be defined as GVA plus taxes on products less subsidies on products. References to economic growth (or when the economy enters recession) typically relate to the rate of change of GDP. All references in this report relate to GVA; also known as GDP at 'basic prices'; and they exclude taxes and subsidies.
11 Provided by BIM and informed by the most recent fishery registrations and activity listings in the aquaculture and processing sectors. Turnover bands were also assigned to the local seafood population based on returns when available, and when not, estimated by BIM based on shared characteristics.

Estimating indirect and induced impacts

To estimate the indirect and induced impacts we have built an input-output model. **Figure 30** presents a stylised version (showing just three sectors for presentation purposes) of our input-output model which is a model that traces how economic activity flows through an economy as one sector makes purchases from another sector.

Fig. 30. Stylised input-output model



We have used the latest Irish input-output tables for the analysis, but have adjusted these in line with academic guidelines (Flegg, A. T. and Tohmo, T. (2013) "Regional input-output tables and the FLQ formula: A case study of Finland") to account for the size and structure of the local economy.[12] The technique involves constructing sub-national input-output models by applying Location Quotients (LQs) and sub-national size adjustments to the standard Ireland input-output tables. The result is that geographies with higher concentrations of industries receiving procurement or household expenditure have larger impacts. In addition, we have used information gathered from the survey to further isolate the procurement spend locally, thereby strengthening the overall modelling assumptions.

MODELLING SUPPLY CHAIN IMPACTS

The survey provided us with information on the size of supply chain spending relative to turnover, its allocation to specific parts of the economy/goods/services and its location (local/national/international). Using this information, we were able to construct a more detailed picture of the first round of supply chain spending than the published input-output tables would otherwise provide.

12 Due to data availability, the local seafood sector's economic impact can only be localised to the regional level (NUTS 3).

We then used the impact model to estimate all the **rounds of supply chain or indirect spending** of the local seafood sector. The input-output tables provide us with an estimate of indirect output by sector. We then convert this output back into sectoral GVA and into sectoral jobs to provide a range of sectoral impact measurements. Applying average sectoral salaries allowed us to estimate the income effect.

The induced impact is economic activity and employment supported by those directly or indirectly employed spending their income on goods and services in the wider economy. This helps to support jobs in the industries that supply these purchases, and typically includes jobs in retail and leisure outlets, companies producing consumer goods and in a range of service industries. Again, our input-output model were used to estimate the induced impacts.

Overcoming double-counting

Throughout the analysis the impact estimates are presented for the core elements of the seafood sector – commercial fishing, aquaculture and fish processing. However, when estimating the total impact of the overall ports seafood sector, simply summing the respective benefits of all three sub-sectors will inevitably over-estimate the indirect and induced and as a result, total impacts. This is because the supply chains of the processing element contain a proportion of the fishing/aquaculture sub-sectors and their supply chains. Therefore, adding everything together would result in the double counting some of the impacts.

We have therefore the following approach to calculate total impacts for GVA, employment, wages and tax:

Direct impacts:

- Calculated by summing the direct impacts from the three elements of the seafood sector for GVA, employment and wages.

Indirect impacts:

- For GVA, employment and wages, total indirect impacts are calculated by summing the indirect impacts of processing and a share of the indirect impacts from the fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing/aquaculture sub-sectors' indirect impacts will already be accounted for in the indirect impacts from the processing sub-sector.

Induced impacts:

- For GVA, employment and wages, total induced impacts are calculated by summing the induced impacts of the local processing sector and a share of the induced impacts from the commercial fishing and aquaculture sub-sectors (as indicated by survey responses showing the extent to which local processors account for their total sales). The remainder of the fishing and aquaculture sub-sectors' induced impacts will already be accounted for within the induced impacts from the fish processing sub-sector.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